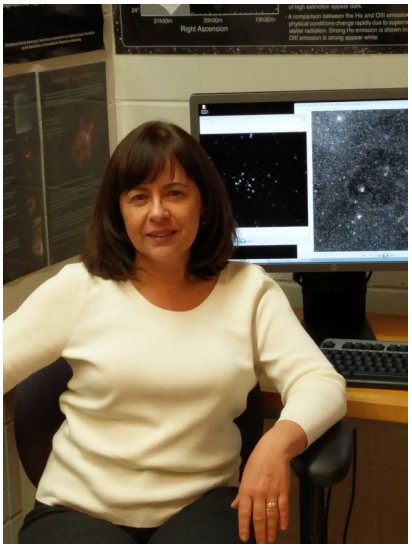
Faculty Spotlight



Dr. Nadia Kaltcheva, Professor, Physics and Astronomy

Could you tell us about your research interests?
My scholarly work is mostly astronomy-related and focused on star-forming fields in our Milky Way galaxy. I use both ground- and space-based data at various wavelengths to look at regions where stars form and learn more about their structure and the interaction between massive stars and the interstellar medium.

What research projects are you currently working on? What would you like your next project to be?
I have several ongoing research projects about stellar parameters, star clusters, and the polarization and extinction of star light. They address issues related to stellar distances, peculiar stars, and properties of the interstellar dust. In my next projects, I would like to go more in depth into what we are already studying. This means utilizing new and better data and more sophisticated analysis to examine details, such as the stellar age gradient across star-forming fields.

What challenges have you faced in your career to date? What have you learned from those experiences?
Astronomy, along with many other STEM disciplines, has developed tremendously in the last decade. Astronomers obtained images of the surroundings of black holes, detected gravitational waves, analyzed the atmospheres of planets around other stars, just to mention a few of the very recent discoveries. Staying competitive in such a field is a challenge, especially for researchers at undergraduate institutions. It is easy to fall behind and give up. Seeking extramural funding is often essential, because it provides support for research-related expenses, means of attending conferences and student participation in professional meetings. From these experiences I have learned the importance of working with collaborators from different institutions and the value our complementary skillsets can add to a research project.

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Can your share your experiences applying for and receiving extramural funding?
The two National Science Foundation (NSF) grants that I have received were instrumental in advancing my studies and supporting research students in various ways. Applying for and managing NSF grants takes a lot of effort and time, and the competition is strong. When seeking external funding, a vital and robust research agenda should be in place. But at the same time, the research should be designed with student participation in mind. Providing research experiences for students is part of our mission, and a very important part of my own work. Many UW Oshkosh students have worked with me and made important contributions to my projects. They presented their research at undergraduate research forums at all levels, such as the National Conferences of Undergraduate Research, UW System Symposia, Posters in the Rotunda in Madison, WI, Annual Wisconsin Space Conferences and at the very prestigious Posters on the Hill event in Washington, DC. Some of the students' contributions also resulted in co-authored journal articles. Even if no publishable work is produced, this provides research experiences that our students would not have had otherwise. Being able to support an inclusive learning environment for undergraduates with different skills and preferences has been a very rewarding experience for me.

Part of my recent work is focused on educational materials that would contribute toward an inclusive environment for astronomy-related education and outreach. For this project I received funding from the Wisconsin Space Grant Consortium (WSGC). WSGC supports faculty research, higher education teaching/training projects and outreach programs in a variety of fields and is a great resource close to home.

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What advice would you give other UW Oshkosh faculty applying for grants?
In the fundamental sciences, the opportunities for external funding are probably less than in applied sciences. Thus, thinking 'outside the box' and taking advantage of all the available resources is essential. Working with the UW Oshkosh Office of Sponsored Programs is very helpful to get a realistic impression about the agencies that your research could fit in.

Think also about the educational aspect of your research. For example, despite the complexity of the astronomy-related research, the astronomy community makes a significant effort towards developing global projects focused on astronomy education and citizen-science opportunities. There is often funding available for such efforts. Using your research expertise to promote the advancements in your field of study is a great educational opportunity.

I would also advise to encourage your students to apply for internships and scholarships themselves. For example, great funding opportunities for students are available through the WSGC. Don't get discouraged if you do not succeed at first. Carefully examine your research agenda and try again. Most importantly, don't let your students get discouraged after an unsuccessful application. Teach them that doing science is hard and needs dedication, but also honor work well done. I believe this is the way to inspire them to join the next generation of scientists.